INSTALLATION AND USER MANUAL

SHELL DOME

BETA VERSION 0,9

Update 07-05-2014

This instrument is made by PrimaLuceLab iSrl, via Roveredo 20/b, 33170 Pordenone (Italy). For any questions concerning the use, support and warranty information, please refer to the addresses given in the relevant documents.

English

CAUTION

This dome has a waterproof nylon cover. It helps to protect the instrumentation from the rain and, thanks to the hemispherical shape, offers high protection from the wind (when properly closed). It does not allow, however, to withstand high loads such as a thick layer of snow. If you have snow on the dome, remove (with a broom) as soon as possible the snow that can be deposited on top of the dome itself.

Do not open the dome when the wind is too strong (eg more than 30 km/h) to avoid that, because of sailing, this can violently open and hurt you.

WARNINGS

The SHELL dome is designed to protect from water the astronomy instruments such as telescopes or radio telescopes. Prima-LuceLab iSrl can not be held responsible for any other use.

If handled improperly, the dome can be damaged and then please follow the instructions below:

- Follow the instructions for the correct installation and use of the dome
- Do not bend, force or modify any part or component of the dome
- Do not incinerate or dispose of in fire any component of the dome

POWER

The SHELL dome is completely manual and requires no power.

Verification of components supplied

Check for the presence of all the components required when ordering.

11 short aluminum arches

33 long aluminum arches

2 dome joints

Nylon fabric

10 bungee cords

13 meters sheath

3 lever locks

5 H profiles

9 columns with U-head

5 columns with flat head

10 Polyethylene profiles 2 x 53cm

4 walls polyethylene 3 x 0,53 m, 1 wall 1,3 x 0,53 m and 1 x 0,53 m wall

9 self-drilling screws

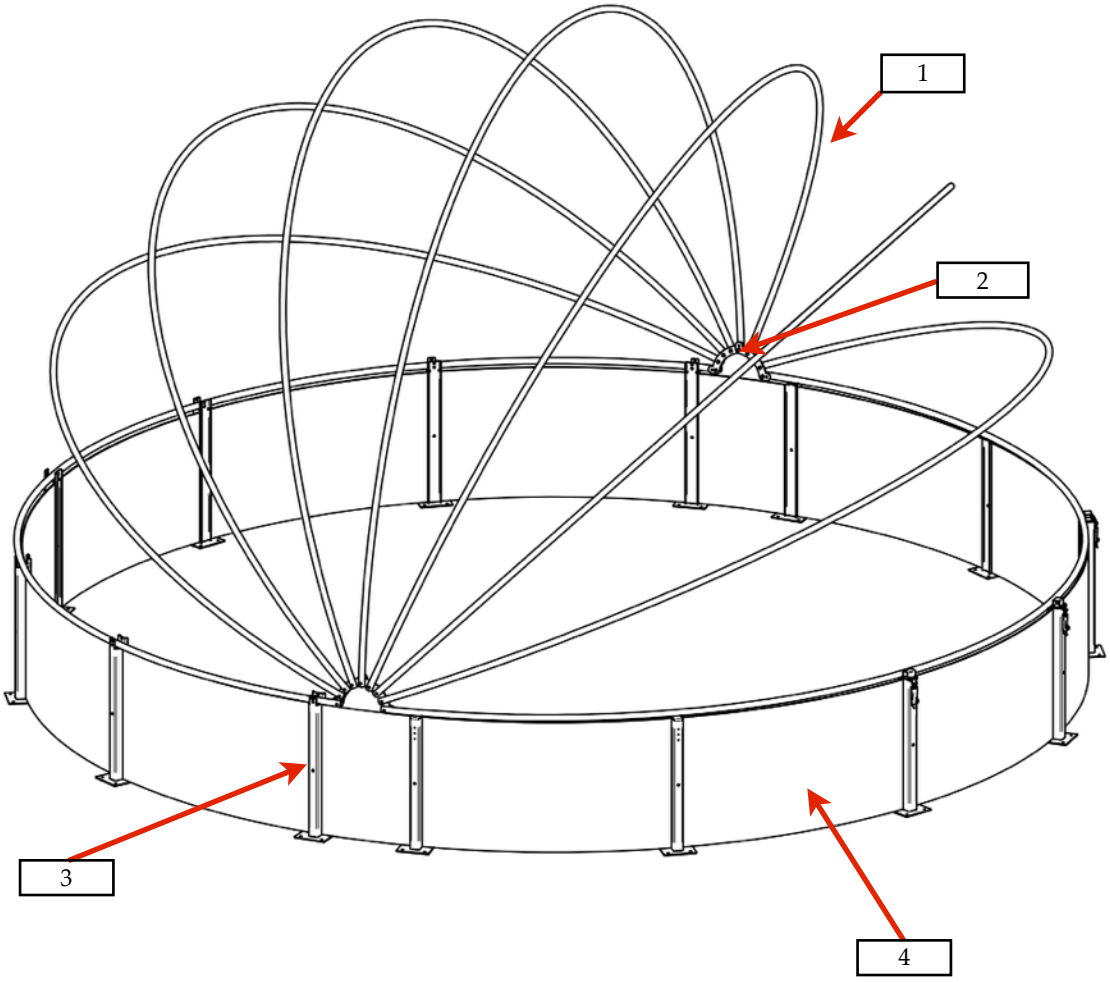
3 locks for arches

10 screws M6x60 with nut and cap nut,
7 screws M6x60 with nut

3 locking pins for closing

Nylon washers 11, 11 bolts and 11 lock washers

Partes identification

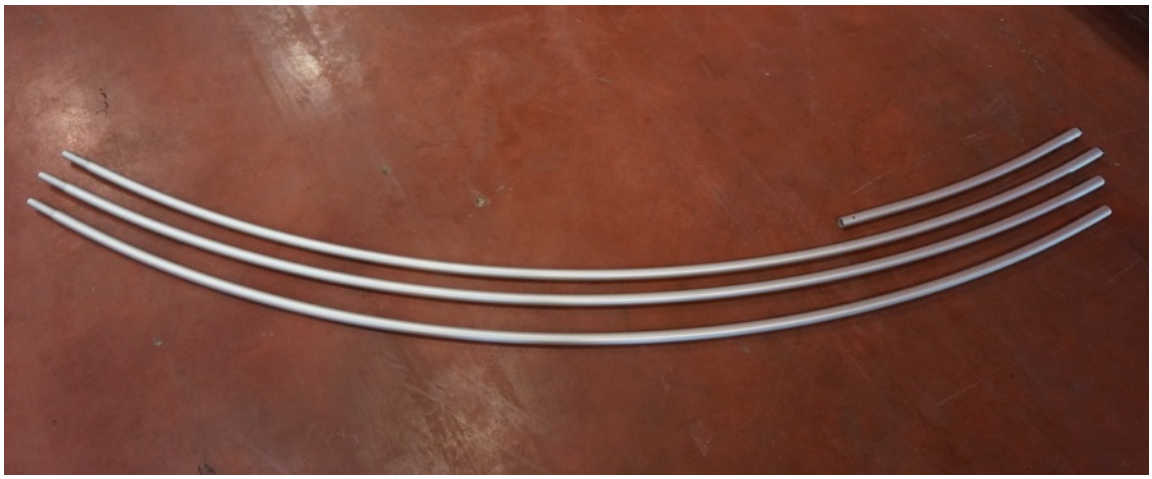


The numbers indicate the name of the component listed below. Read the following sections for details on operation.

1	Support rods of the dome	3	Metal columns
2	Dome joints	4	Polyethylene wall

Installation:

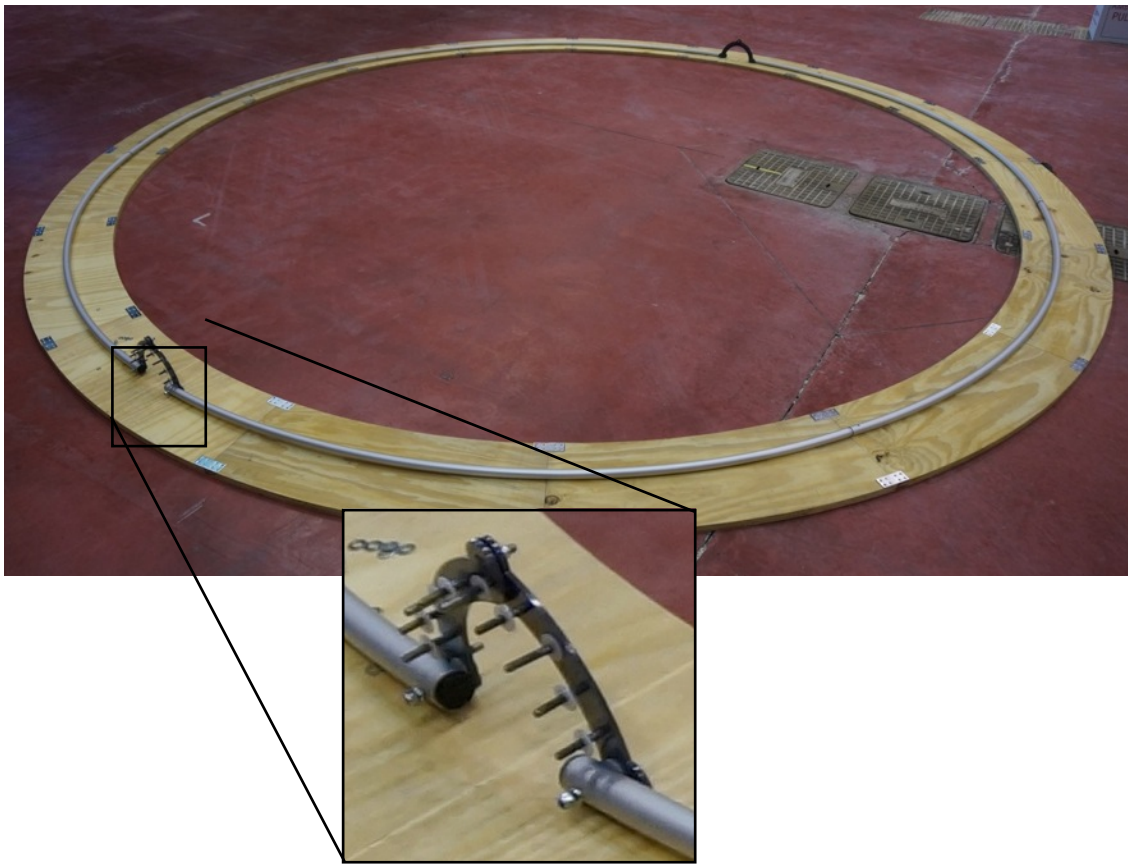
Take the dome support rods: each rod is composed of 4 elements, 3 long and one short. Join them by using the appropriate mechanism with spring button and make sure that at the end of each rods there is a black plastic cap.



Place on a plane all rods that you are mounting. Two rods have a diameter slightly larger than the other and they're are those that will be positioned to form the contour of the dome. Then put them aside.

Take the two dome joints and insert, in the threaded screws, a Teflon washer for each screw.

Among all the arches installed, 2 have a larger diameter. Take them and place them to form a circle. So take the two dome joints and put their screws into the outermost hole in the end of each arch. Then close the threaded screw (be careful, you might need a little effort to get it in the auction given arch large size) by first inserting a metal washer and then a nut. Tighten (but not too strained) with a key.



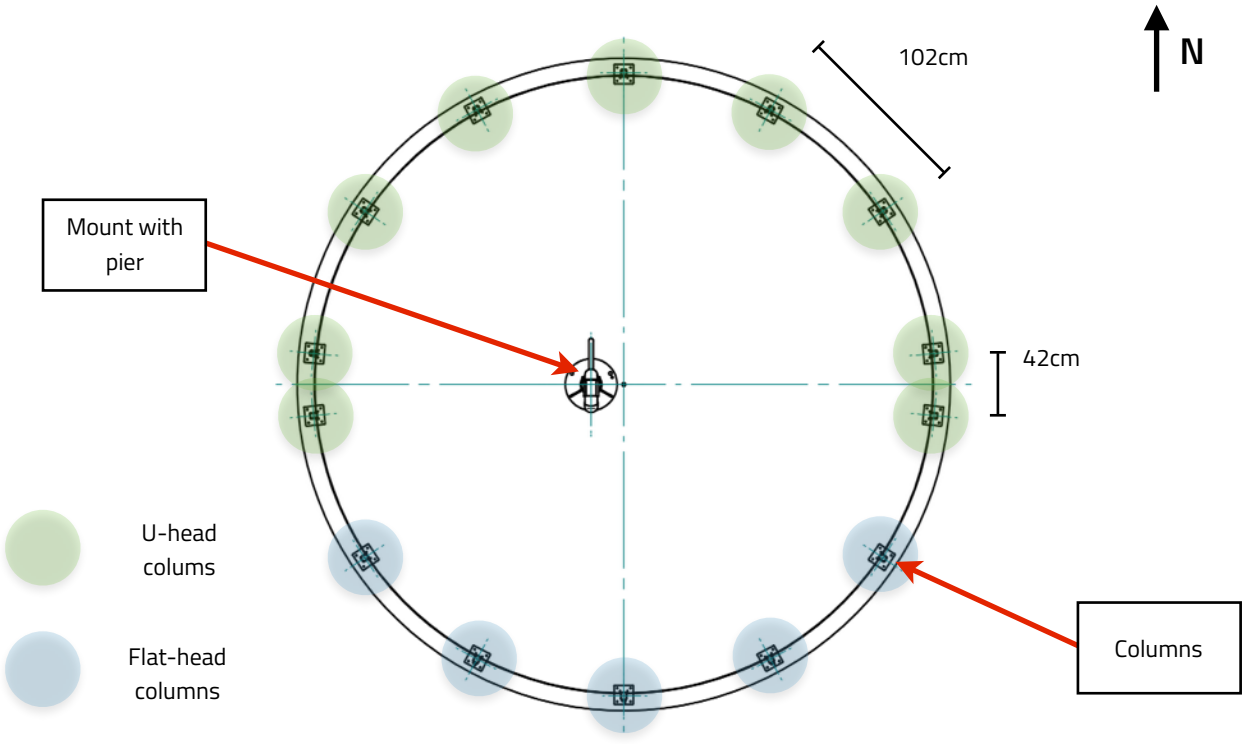
Then take the other arches and insert them gradually one by one in threaded screws. Remember not to strain the screws too much when entering the arches. The best technique is to get help from a person entering, at the same time, the two extremes of the same arch in two different joints. Attach each arc on the threaded screws inserting a metal washer and then a nut. Tighten (but not too strained) with a key.

The structure will look like in this picture. All arch will be installed: you will notice that the central one remains standing alone.

If you are installing the dome to protect the Spider230 radio telescope, consider that the arc of the dome, that you have to open and close, should be facing south. So the two dome joints should be placed towards the East and West. You can use an ordinary compass to identify the direction of the cardinal points.

So let's install dome base. Take 4 metal columns with U-head and place them under each dome joint. Then put another U-head column in the orthogonal direction, in that part of the dome that will be closed (to the North if you are installing the dome to protect the Spider230 radio telescope). Put flat-head column in the opposite position, in the part of the dome that will open (to the South if you are installing the dome to protect the Spider230 radio telescope).

Each column has 4 holes in the base for installation on a plane. For now fix only one set screw (the screw type depends on the base used) for column: this way you'll have the ability to slightly move the column, but in any case it will be stable for at this stage of assembly. Take all the other columns and place them as shown below (top view):



Make sure that the outer dome arch (the one with greater diameter) stays naturally at the center of the column. If it touches a point too inside or too outside, slightly move the column to find the best position. Try to open and close the South side facing of the dome structure (you can help with a person which holds the North facing part of the dome while another person opens and closes the South part). Verified that the position of the columns is perfect with respect to the dome structure, fixed base columns using the other 3 remaining holes.

Each column with head U presents, in the upper part, two holes. In columns facing North (in total 7 items) use the upper hole by inserting a M6x60 screw (one for each hole): the screw is used to lock the arch inserted in the columns. In this way, the opening of the dome facing North will be blocked. For additional stability, you can use the lower hole drilling (eg a drill) the arch and secure it with another M6x60 screw.

Now take the white Nylon fabric. This will be fixed to the arch through special velcro attacks. Fully open the dome structure: the support arch are thus collected on the north side. Open the Nylon fabric and identify which part will be facing South. Then fastened the Velcro attacks of South fabric part on upper arch.

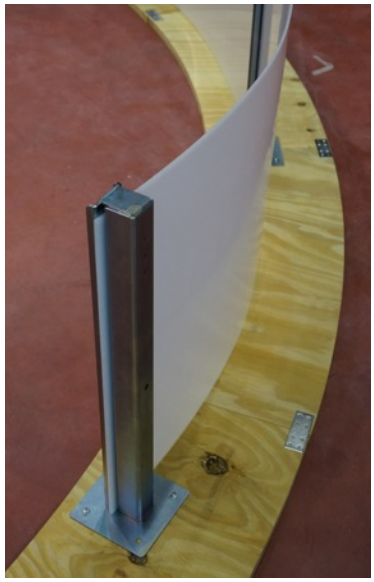
(photography of attack of the first fabric section)

While a person higher the support arches (then operating as if he was closing the dome), another person gradually closes all Velcro attacks.

(photo of dome while closing the Velcro attacks)

Proceed with caution making sure to close all Velcro fasteners and, if necessary, correcting slightly the position of the nylon fabric to match perfectly with the underlying support structure with aluminum arches. At the end of this procedure, you will have completely fixed the nylon fabric on the dome.

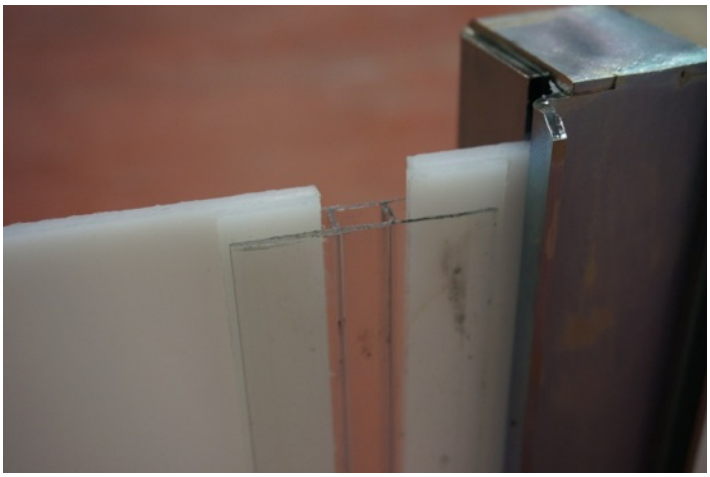
Now take the 4 walls of Polyethylene 3 meters long each, and insert them into the slot in each column. In this way you can build the wall around the dome.

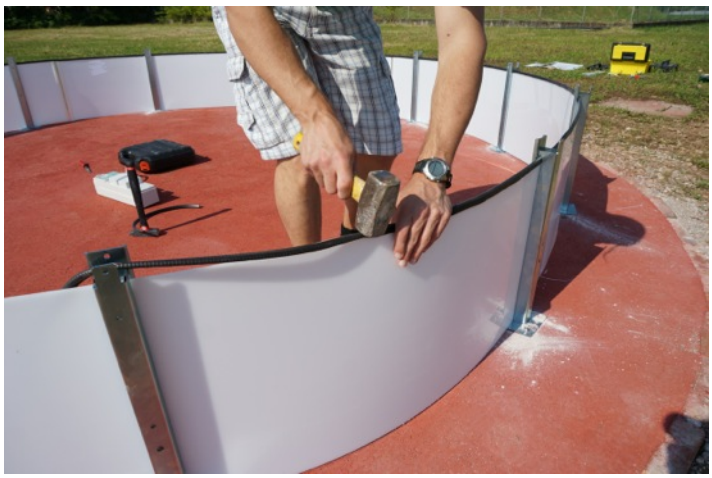


Since the circumference of the dome is approximately 13 meters long, by inserting the 4 walls (3 meters long) will be a brief loss of about 1 meter. Enter in this space the 1 meter element that you find in the package of the dome. Small differences in the installation position of the columns may lead to a slightly different circumference. If the 1 meter element is too long you can cut it slightly. If it is too short, in the packaging of the dome you can find an additional Polyethylene element 1.3 meters long. So you can fit the circumference of your dome.

To tie together the Polyethylene walls, you can use the 5 H profiles. Enter a profile between two Polyethylene walls. To avoid to inadvertently cut yourself, we recommend you to wear protective gloves.

To achieve optimum fastening of the Polyethylene walls between them, also included two 3mm x 53cm Polyethylene profiles for each H profile (one for each side). In this way the Polyethylene walls will be fixed firmly and without the need to close them with screws.

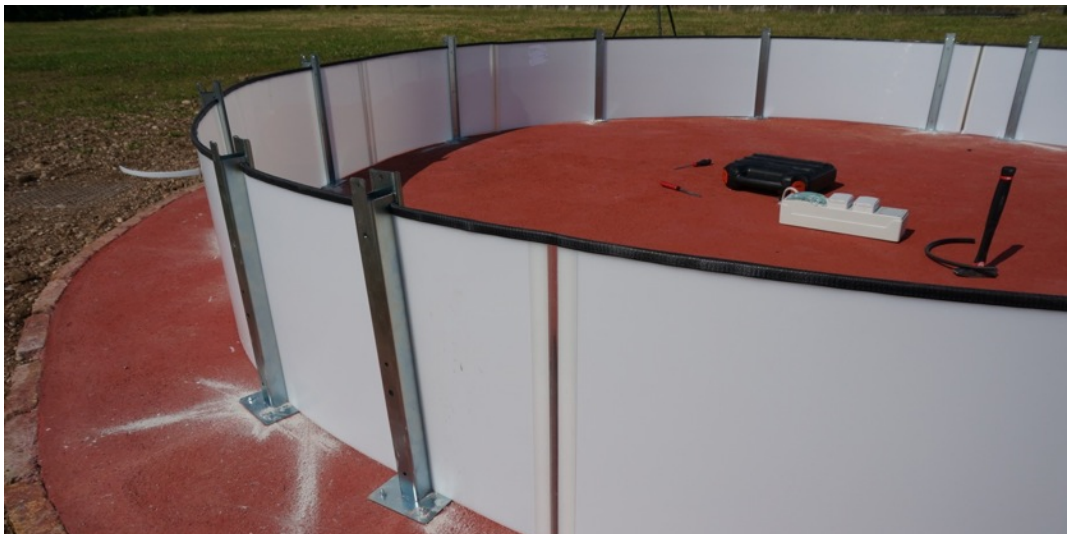




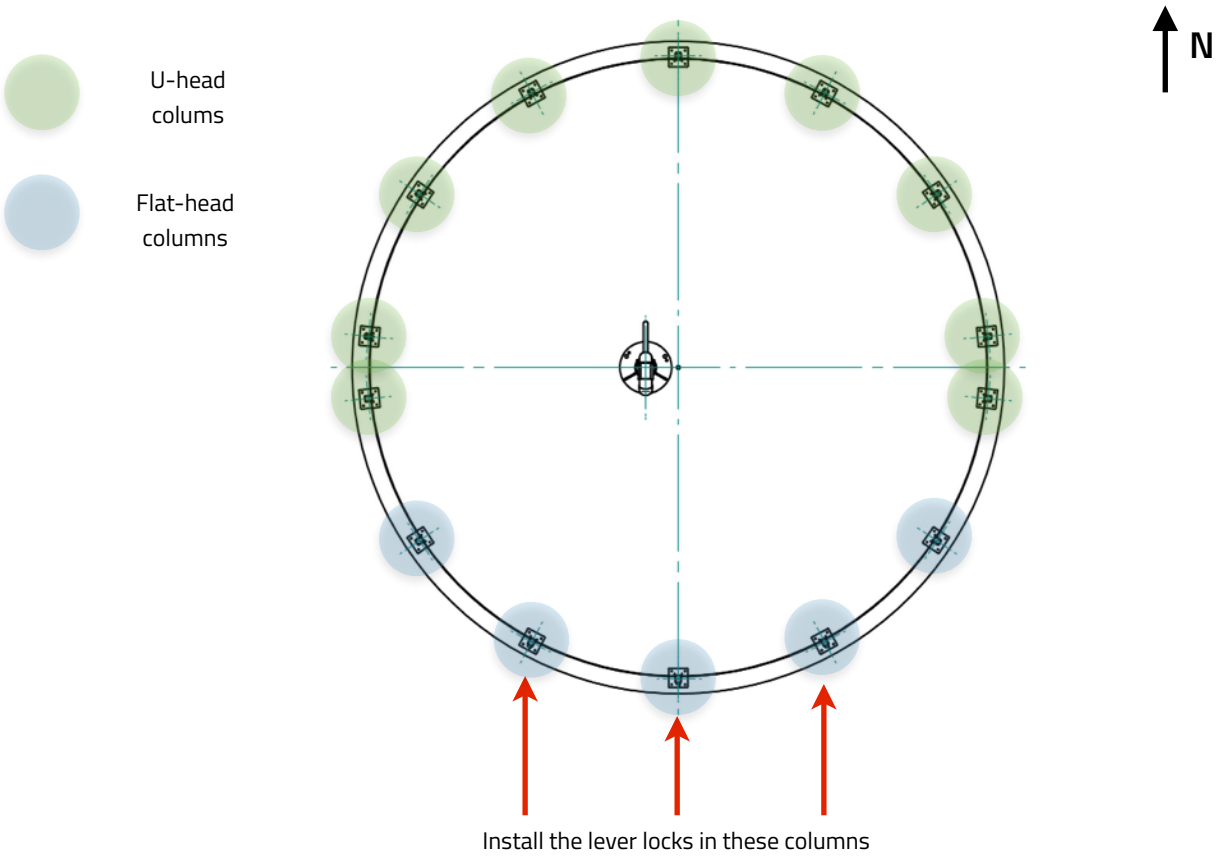
Take 13 meters of protective sheath and fix the top of the Polyethylene wall, between a column and the following one. In order to put it on the Polyethylene, you can help yourself with a hammer as shown in the figure.

The sheath should not be installed in correspondence of the columns so you can cut it with scissors.

After installation, the sheath will be all around the dome, as shown in the image below.



Next, take the self-drilling screws and use a screwdriver to install the 3 lever locks. You need to install one lever lock for every column, using 3 self-drilling screws for every lever lock.



Now take the 3 locks for arches: you have to attach these in the bottom aluminum arch (the one that lay in horizontal position when the dome is closed), just in correspondence of the columns where you previously installed the lever locks.

In order to install the locks for arches you have to:

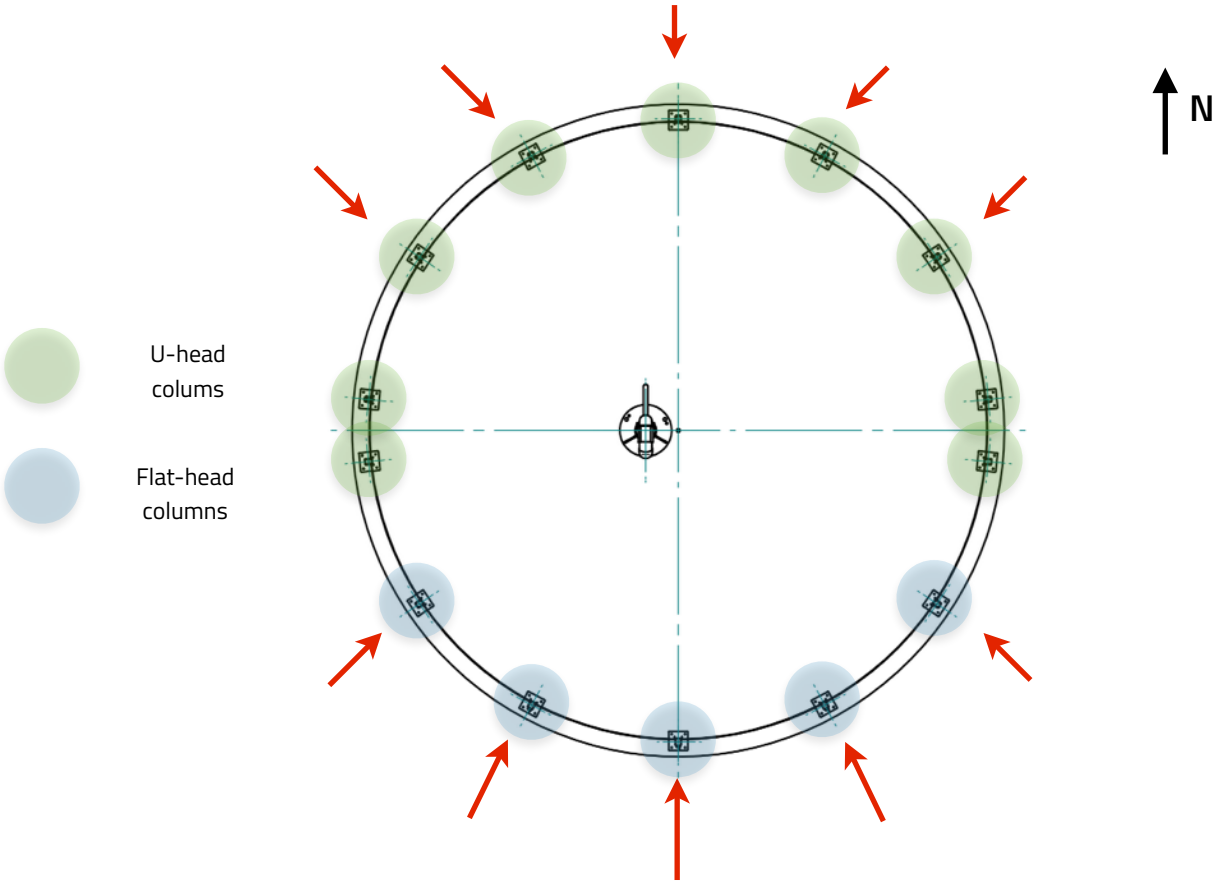
1) unscrews the 4 M5x10 screws that joins 2 parts of every lock.

2) separate the 2 parts

3) re-join the 2 parts and use the same M5x10 screws to fix the lock in the right position (just above the flat head column, as pictured right).

You're now able to use the lever locks to close the aluminium arch (you can use one of 3 locking pins for closing - as shown in the picture).

Now take the 10 screws M6x60 with nut and cap nut, remove the nut and the cap nut and install one screw in every column, as indicated in the below scheme.

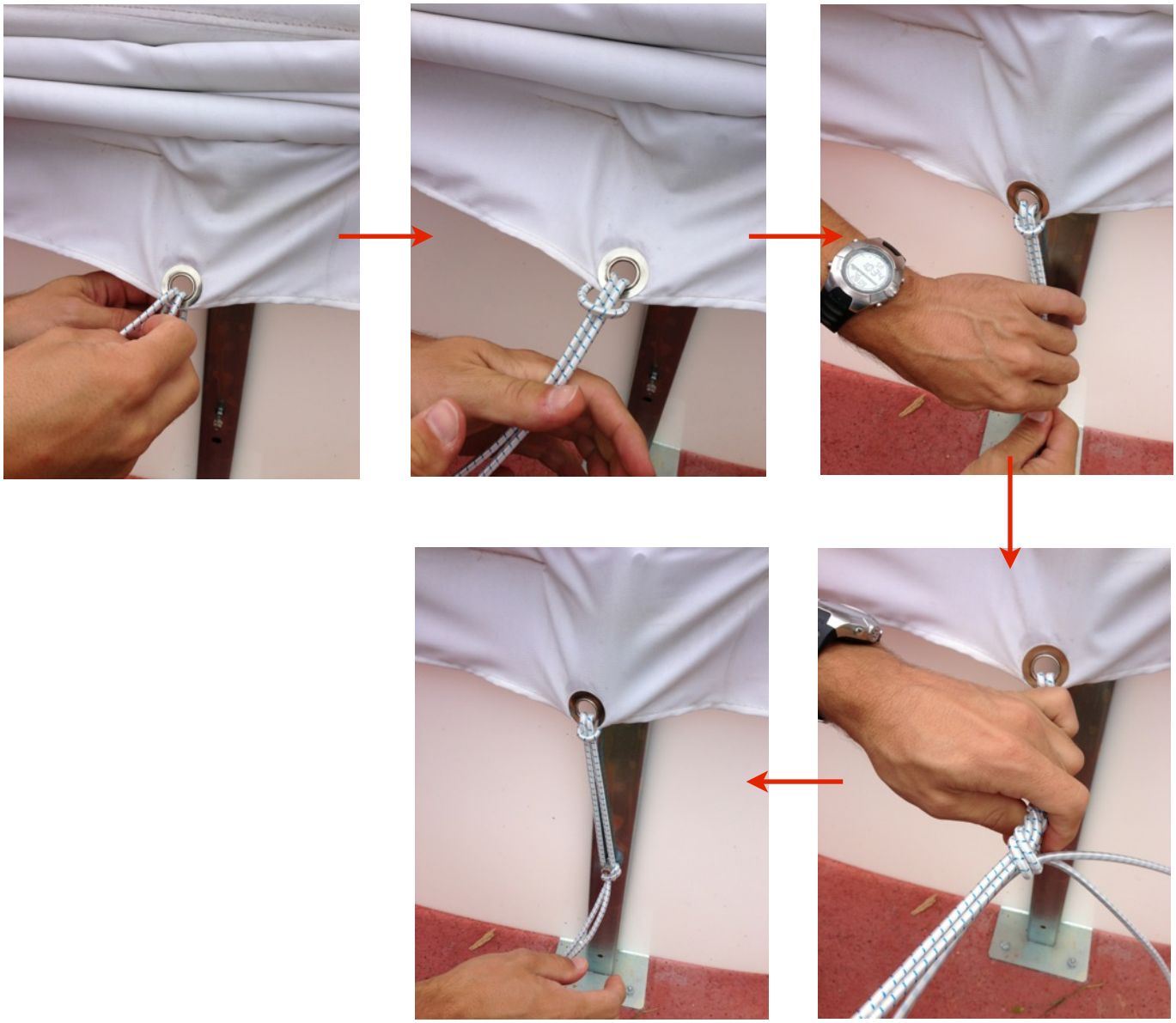


Install the screws M6x60 with nut and cap nut in the columns indicated by the red arrows

As you can see in the right picture, you will insert the screws from the inner part of the dome, then you will fix it with the nut and then you will screw the cap nut.

Note that, in order to insert the M6x60 screw, you will need to make a hole in the polyethylene walls (using, for example, a drill).

Last, take the 10 bungee cords that will be used to fix the Nylon covering just in the columns, using the M6x60 screws with cap nut you just installed. You will need to create a node, you can take a look at below pictures.



You can set the position of the node in order to be at the right length but note, **do not not pull too much the bungee cords or the hole in the Nylon covering will tear.**